



Donald Freytes



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Regenerating Tissues using Pluripotent Stem Cells

Research emphasis:

Dr. Freyte's laboratory focuses on the design and testing of bioengineered tissues mainly composed of pluripotent stem cell derived repair cells and tissue specific extracellular matrix scaffolds. The overall goal is to develop new strategies to assemble and test bioengineered constructs capable of restoring tissue function. The major goals of the laboratory are: 1) to harness the power of tissue specific extracellular matrices to guide stem cell differentiation and/or tissue remodeling *in vitro* and *in vivo*; and 2) to understand and harness the interaction between inflammatory cells and bioengineered tissue constructs in order to improve incorporation and survival.

Application:

- Host-biomaterial interactions (human)
- Stem cell differentiation (human)
- Design of culture systems

Collaboration potential:

- Stem cell derivation and characterization
- Inflammatory-cell interactions
- Tissue specific extracellular matrix scaffold preparation

Selected publications: (limit 4)

Spiller KL, Wrona EA, Romero-Torres S, Pallotta I, Graney PL, Witherel CE, Urbanska A, Santambrogio L, Panicker LM, Feldman RA, Vunjak-Novakovic G, and Freytes DO. Differential Gene Expression in Human, Murine, and Cell Line-derived Macrophages. *Experimental Cell Research*. In Press (Oct 2015)

Pallotta I, Sun B, Wrona EA, and Freytes DO. BMP Protein Mediated Cross-Talk between Inflammatory Cells and Human Pluripotent Stem Cell-derived Cardiomyocytes. *J Tissue Eng and Regen Med*. In Press (April 2015).

Freytes DO, O'Neill JD, Duan-Arnold Y, Wrona E and Vunjak-Novakovic G. Natural Cardiac Extracellular Matrix Hydrogels for Cultivation of Human Stem Cell-Derived Cardiomyocytes. *Methods in Molecular Biology*. Vol 1181:69-81 2014.